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Cutlery scourers.

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A.D. 1864. APRIL 22. N° 1011.  
PEPPER'S SPECIFICATION.

FIG. 17.

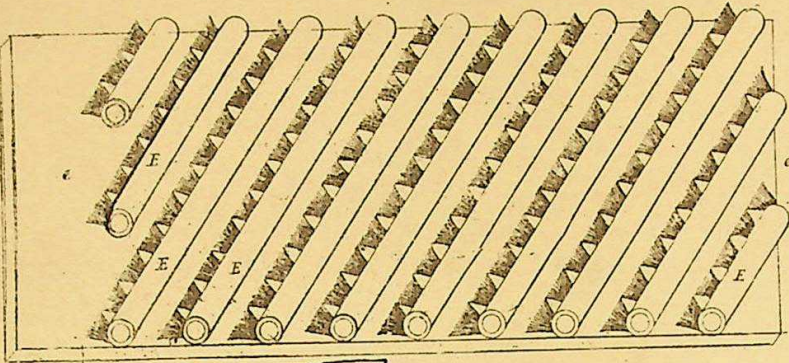


FIG. 18

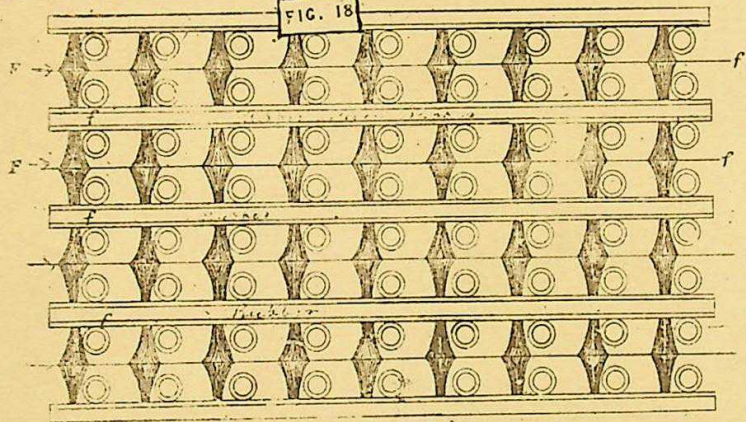
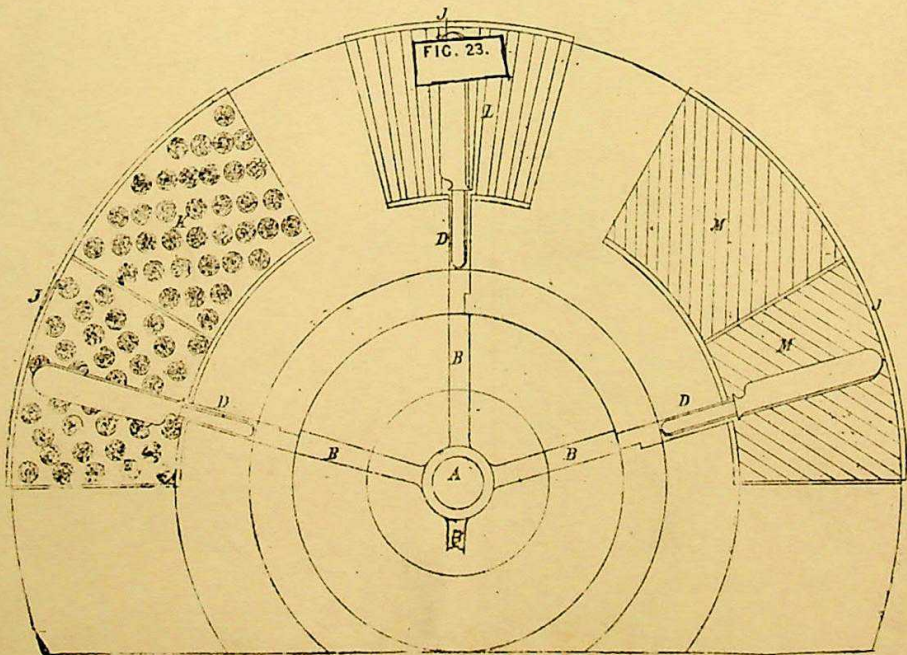


FIG. 23.





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[2 SHEETS]  
SHEET 2.  
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Pepper.

FIG. 19.

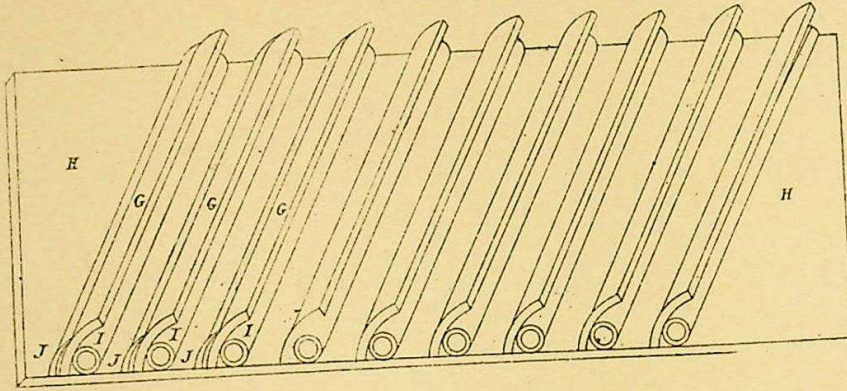


FIG. 20.

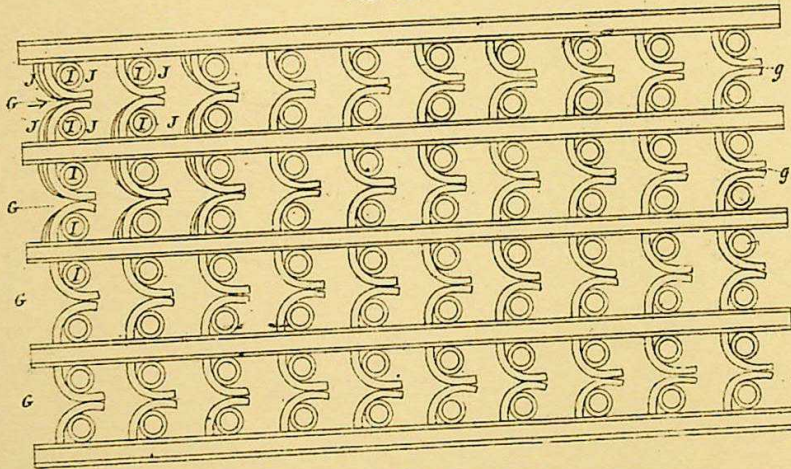
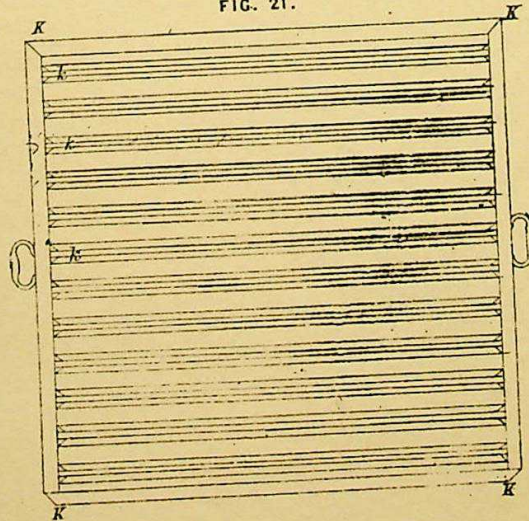


FIG. 21.

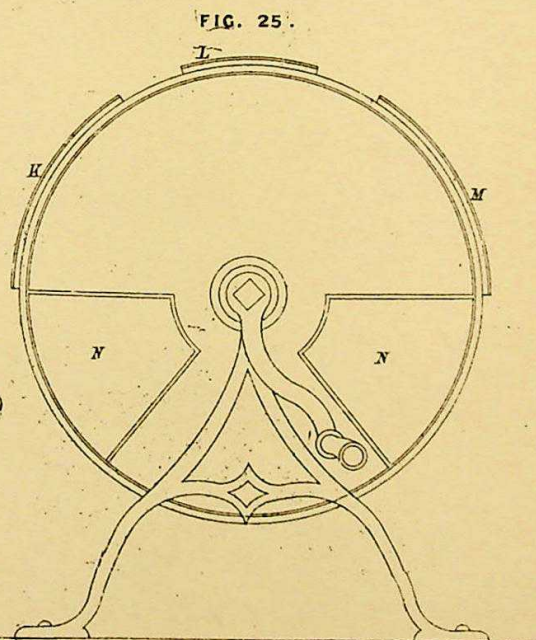
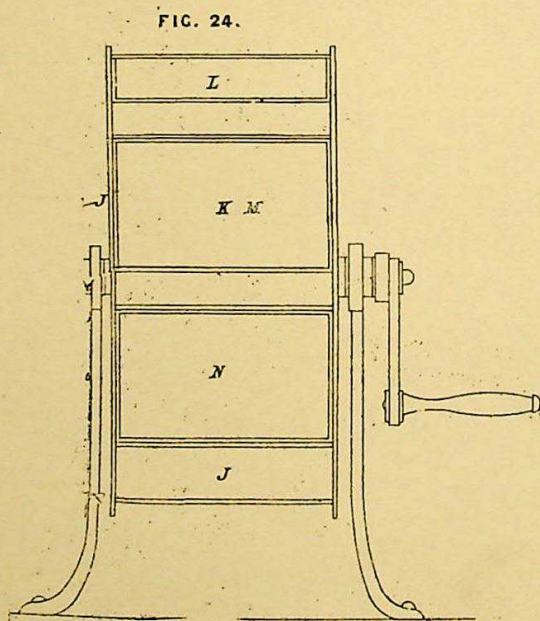
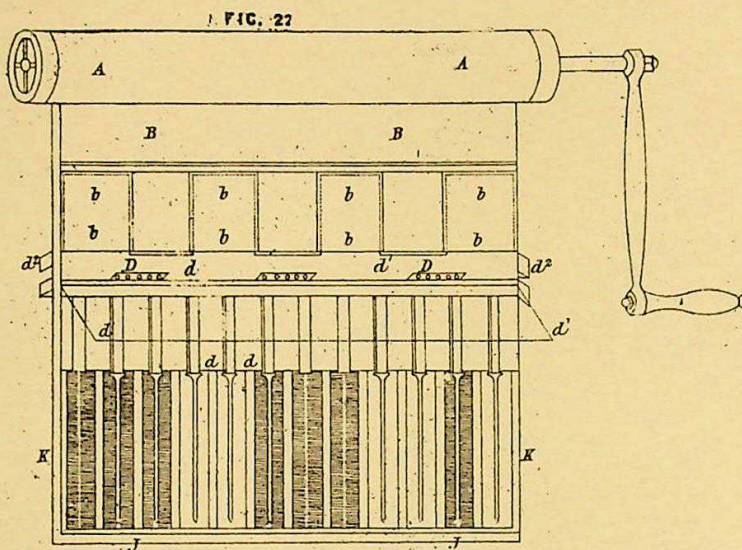




51. GRINDING AND POLISHING,  
Metal,  
Cutlery Scourers.

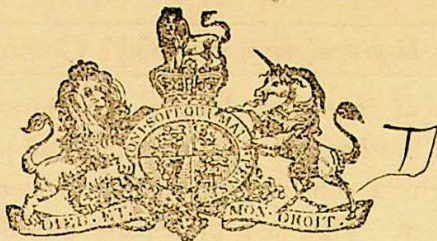
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1011 of 1864.





*cutting scower*



A.D. 1864, 22nd APRIL. N° 1011. *AD*

### Boot and Knife Cleaning Machine.

LETTERS PATENT to Tobiah Pepper, of No. 17, Newington Green, in the County of Middlesex, for the Invention of "AN IMPROVED BOOT AND KNIFE CLEANING MACHINE."

Sealed the 13th October 1864, and dated the 22nd April 1864.

PROVISIONAL SPECIFICATION left by the said Tobiah Pepper at the Office of the Commissioners of Patents, with his Petition, on the 22nd April 1864.

I, TOBIAH PEPPER, of No. 17, Newington Green, in the County of Middlesex,  
5 do hereby declare the nature of the said Invention for "AN IMPROVED BOOT AND KNIFE CLEANING MACHINE," to be as follows, viz. :—

The object of this improved machine is to clean boots and shoes, knives and forks, and such like articles in a more efficient and rapid manner and in much greater numbers at one operation than can be accomplished at present  
10 by any other machine or apparatus.

The leading principle of my Invention is this, that the articles to be cleaned are held firmly by suitable spring holders radiating from a common axis, and in their revolutions these spring holders press such articles through sets of improved cleaning apparatus.

15 This improved machine consists of a fixed circular case or drum of any convenient diameter and length, through which passes a rotating axis. Upon this axis are fixed through its whole internal length or otherwise any convenient number of radial bosses to receive and retain the necessary radiating spring holders.



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*Pepper's Improved Boot and Knife Cleaning Machine.*

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The several sets of improved cleaning apparatus used in my machine consist of a series of brushes and other cleaning and polishing substances and surfaces of such peculiar construction and arrangement as will best secure the greatest efficiency. They are principally attached to the inner side of the periphery of the drum, and of which their bases form moveable parts or arcs which can be readily fixed for use, removed, adjusted, and replaced at pleasure. 5

For the purpose of cleaning boots and shoes these sets of improved cleaning apparatus consist of any required number of pairs of elastic or spring brushes and other suitable substances for the purpose of cleaning, blacking, and polishing, nearly semicircular in form, of sufficient size to span a boot, and of any convenient length in the line of motion. They are open at the top of the circle or arc, but meet or overlap in the centre thereof, so as to permit the boots to pass freely through the segmental chamber, while the spring or elasticity of the arcs presses the brushes and other required substances which line the inner surfaces of the arcs firmly against all parts of the boots as they pass briskly through the chamber, and thus secure the same amount of brilliant polish as can be given by hand brushing. The blacking is supplied to the necessary brushes from a reservoir connected therewith and conveyed through suitable channels to all parts of the brushes. 15 20

For knives the improved cleaning apparatus consists principally of any required number of pairs of long spring brushes and other suitable substances and surfaces adapted for cleaning, sharpening, and polishing purposes, which extend from the periphery of the drum of the machine about eight inches or more towards the common axis, but at right angles thereto and parallel to the plane of motion. These brushes and other surfaces are placed with their faces in contact with each other, and may extend to any convenient distance round the periphery or circle of motion, so that as the radiating spring holders rotate upon the axis they press the knives between the several sets of cleaning, sharpening, and polishing surfaces, which through their elastic pressure upon the articles secure the desired sharpening and polishing effects. A rotary motion is given to this machine by any convenient mode or power. 25 30

The simplicity and facility of this machine are such that the number of articles which it can easily be made capable of bringing under the cleaning process at the same time may be increased to meet any requirement, even to the extent of some two or three hundred articles at once if necessary, while a lad is quite sufficient to work it. 35



*Pepper's Improved Boot and Knife Cleaning Machine.*

**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said Tobiah Pepper in the Great Seal Patent Office on the 22nd October 1864.

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, TOBIAH**  
5 **PEPPER**, of No. 17, Newington Green, in the County of Middlesex, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-second day of April, in the year of our Lord One thousand eight hundred and sixty-four, in the twenty-seventh year of  
10 Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Tobiah Pepper, Her special licence that I, the said Tobiah Pepper, my executors, administrators, and assigns, or such others as I, the said Tobiah Pepper, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at  
15 all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "**AN IMPROVED BOOT AND KNIFE CLEANING MACHINE**," upon the condition (amongst others) that I, the said Tobiah Pepper, my executors or administrators,  
20 by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

25 **NOW KNOW YE**, that I, the said Tobiah Pepper, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The object of this improved machine is to clean boots and shoes, knives  
30 and forks, and such like articles in a more efficient and rapid manner and in much greater numbers at one operation than can be accomplished at present by any other machine or apparatus.

The leading principle in my Invention is this, that the articles to be cleaned are held firmly by suitable spring holders radiating from a common  
35 axis by means of radial bosses, and in their revolutions these spring holders press such articles through sets of improved cleaning apparatus.

This improved machine consists of a fixed circular case or drum of any



*Pepper's Improved Boot and Knife Cleaning Machine.*

convenient diameter and length, through which passes a rotating axis, and mounted upon any convenient stand.

This machine, with its internal fittings, apparatus, and use, will be clearly shewn by the Drawings annexed hereto accompanied by the following description. Upon the axis of this machine are fixed through its whole 5 internal length or otherwise any convenient number of radial bosses to receive and retain the necessary radiating spring holders.

Fig. 1 shows this axis with two of the radial bosses. A, A, is the cylindrical axis running through the extreme length of the drum of any required diameter, and made of either wood or metal. This axis terminates at each 10 end in a spindle *a, a*, the spindle acting at each end in bearings fixed either to the supporting frame, as in Fig. 24, or to the sides of the fixed drum. A fly wheel, treadle and crank, or drum and band may be fixed to the spindle if required. B, B, are two bosses radiating from the axis, to which they are firmly fixed by strong screws. Any convenient number from one to sixteen 15 of these bosses may be fixed upon the axis through its whole internal length, allowing sufficient lateral room for them to rotate freely with the axis within the drum. These bosses if made of metal may be about  $\frac{3}{4}$  of an inch thick and about 7 inches deep. They are mortised to the depth of about 4 inches in any desired number of places, as at *b, b, b*. These mortices are for the 20 purpose of enabling the bosses to receive and retain the spring holders firmly while at work.

Fig. 2 shows one of these radiating spring holders C, C, adapted for boot cleaning, and Fig. 3 another set of spring holders D, D, adapted for knife and fork cleaning. It will be at once seen that the upper part of both these 25 holders are alike, and they both correspond to the mortices in the bosses. In Figs. 2 and 3 the tenons *b, b, b*, exactly fit into the mortices of Fig. 1, marked also *b, b, b*, by which the spring holders are fixed into the bosses and held firm therein by thumbscrews passing through the bosses, as at *b<sup>1</sup>, b<sup>1</sup>*, thus securing the holders from derangement and oscillation while at work. The 30 lower part of the spring holder, Fig. 2, terminates in 4 spring legs *c, c, c*, about 12 or 13 inches long, for the purpose of holding 4 boots or shoes abreast, with a tapering tongue running about half way down the leg, as at *c<sup>1</sup>, c<sup>1</sup>, c<sup>1</sup>*. At the bottom of the tongue there is a metal frame or socket *c<sup>2</sup>*, into which a foot piece fixes with a plate and screw. The lower part of each of these legs 35 is carved to suit the heel of the boot, to which also a heel piece may be attached. In Fig. 3 there are a number of openings or beds in the lower part about 4 or 5 inches long, fitted with springs and lined with some soft material, as at *d, d, d*, into which the handles of knives or forks are to be



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inserted for cleaning, as at  $d^1$ ,  $d^1$ , and a lid or covering hinged upon the face of the holder at  $d^2$ ,  $d^2$ , being fitted with an elastic lining, is fastened down entirely over the handles and forms an additional spring guard to the handles, preventing any oscillation or displacement during the cleaning  
5 process as well as protecting them from dust and friction. It will be found preferable to make these spring holders of metal, their size varying according to the size of the machine, and they can be made to hold a less or a greater number of articles than what is shown in the Drawings. In the holders for knives there is a spring stop placed on each edge, as at  $d^3$ ,  $d^3$ ,  
10 and a corresponding fixed one to each of these on the frame of the machine for the purpose of preventing a backward motion while knives are being cleaned, as they must always be cleaned with a direct or forward motion, and these spring stops would prevent any one giving the axis a backward motion. When forks are being cleaned these stops are to be held back by a screw  
15 lever, so as to allow the rotation to be both direct and backward.

Fig. 4 is the foot piece before mentioned. E is the expanding part, which enters the boot and is made of thin sheet metal, thinner at the sides than at the instep, somewhat in the shape of the fore part of the foot. The sides being partially elastic will compress or expand to the size of the boot; the bracket  
20 plate  $e$  fixes into the socket of the tongue of the spring holder, as before alluded to.

Fig. 5 is the metal heel piece referred to, which is attached to the bottom of the leg in the spring holder by two pins fixed inside the heel piece, which pass through the leg and thus secure its position while in use. The sides  
25 F, F, are sufficiently elastic to adapt themselves to the width of the boot.

Fig. 6 shows the foot and heel pieces attached to the spring holder at  $f$  quite ready for receiving a boot to be cleaned.

Fig. 7 shows the use and value of the metal tongue, for without this tongue it would require a different foot piece for each of the various sized boots to be  
30 cleaned, and there would also be a difficulty in placing a boot upon the holder and the same in removing it. But the tongue acting as a spring allows the foot piece to contract into a shorter space by yielding to the required pressure, as at G, and the toe of the foot piece, whose natural position would be at  $g$ , is thereby brought to  $g^1$ , and the broad part of the sides of the foot piece  
35 encloses a part of the heel piece, as at  $g^2$ .

Fig. 8 exhibits a boot placed upon the holder ready for cleaning. The boot being rather a small one compresses the foot piece to its own shape and size by means of the tongue, which is thrust back some little distance from its position, as at G<sup>1</sup>. The foot piece being made to fit the largest sized boots



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will suit any smaller size by contraction, and the strength of the spring in the tongue is such as to keep the foot piece thrust out to the fullest extent the boot will allow. Additional strength may be given if desired to the expansion of the foot piece by a spiral spring or other elastic power fixed within the foot piece and projecting against the inner back of the heel piece. 5

Fig. 9 is a waterproof stocking H, which can be fixed upon the upper part of the leg *h* to be drawn over such boot tops as do not require to be blackened, an having an elastic band *h*<sup>1</sup> at the bottom will effectually protect the tops from the action of the brushes, while the lower part of the boot is left free for cleaning, as at *h*<sup>2</sup>. 10

The several sets of improved cleaning apparatus used in my machine consist of a series of brushes and other cleaning and polishing surfaces, of such peculiar construction and arrangement as will best secure the greatest efficiency. They are principally attached to the inner side of the periphery of the drum, and of which their bases form moveable parts or arcs, which 15 can be readily fixed for use, removed, adjusted, and replaced at pleasure.

For the purpose of cleaning boots and shoes these sets of improved cleaning apparatus consist of any required number of pairs of elastic or spring brushes, and other suitable substances, for the purpose of cleaning, blacking, and polishing, nearly semicircular in form, of sufficient size to span a boot, 20 and of any convenient length in the line of motion. They are open at the top of the arc, but meet or overlap in the centre thereof, so as to permit the boot to pass freely through the segmental chamber, while the spring or elasticity of the arcs presses the brushes and other required substances which line the inner surface of the arcs firmly against all parts of the boots as they 25 pass briskly through the chamber, and secure the same amount of brilliant polish as can be given by hand. The blacking is supplied to the necessary brushes from a reservoir connected therewith, and conveyed through suitable channels to all parts of the brushes.

Fig. 10 exhibits a pair of these brushes in their natural or undisturbed 30 state, forming nearly a semicircle, and attached to the frame of the periphery I, I, as their base. At J, J, is shewn the lower side of one of these brushes, which is straight, without any breaks or joints, about 1½ inches deep. Upon the top of this are hinged by india-rubber or other elastic material several short brushes J<sup>1</sup>, J<sup>1</sup>, about 1 inch deep, and all hinged together in the same 35 way, and upon the top of these a series of tapering brushes, as at J<sup>2</sup>, J<sup>2</sup>, are also hinged. They are about 3½ inches wide at the base, and about 1 inch at the extreme ends, which are about 3½ inches from the base. They may be either straight or slightly curved, and of a cylindrical shape. Their foundations



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may be of metal. They are placed about  $1\frac{1}{2}$  inches apart, in order to allow their fellow brushes of the same shape from the other side to overlap amongst them, as these also overlap on the further side. These top brushes have a joint at their half length, and may be divided down the centre, and held together loosely by strips of vulcanized india-rubber, so as to allow them a little play. All these lateral joints are grooved on the outer side, and along this groove is firmly inserted a piece of vulcanized india-rubber or narrow tubing, which acts as a spring, and by enclosing this tubing within a band of the same material a counter spring is produced, preventing the brushes from falling below a certain curve, or the band may run at right angles to the tubing. The required strength of spring and elasticity is regulated by the diameter and thickness of the tube and band. At K we see the method of a boot entering the segmental chamber of the brushes, which by their mutual overlapping position and spring embrace the boot fully at the top as well as at the sides, and as the boot presses briskly forward amongst the brushes they are gradually raised by the figure of the boot until they reach the heel, when they at once descend to their original position, and at the same time give any amount of friction to the surface of the boot, by which it is cleaned and brought into a beautiful polish.

Fig. 11 gives an enlarged view of one of the brushes with the spring tubing and band in position. L, L, is the bottom brush, fastened down to the frame of the periphery of the drum at its lower edge by double hinges of india-rubber or other approved elastic fastening, one on each side, by which it will yield to the pressure of a much larger sized boot. l, l, l, is the india-rubber tubing filling in the grooved joints of the different brushes, which acts as a powerful spring to press the brushes down, and l', l', l', is the band of india-rubber in its twofold position, which prevents the brushes from being pressed too much over and sinking beyond the required curve. The necessary spring and elasticity may also be given by metal springs instead of or conjointly with india-rubber.

One mode of making the blacking brushes is shown by Figure 12. These brushes require to be rather smaller than the others, and closer together; their general form is much the same. The overlapping parts M, M, are not divided with lateral or transverse joints, as in the others; but their great peculiarity is, that they are hollow, for the purpose of holding and transmitting the blacking. The foundation or under surface into which the hair is inserted is made of copper or other suitable metal or material, which is freely perforated between the tufts of hair. Over this is laid a thick coating of sponge or other absorbent material throughout every part of the brushes, and a



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covering of waterproof cloth or other suitable material encloses the sponge, and is well fastened down to the edges of the foundation, so as to prove watertight. The sponge thus becomes a bed or stuffing within the covering, into which the blacking flows down from its reservoir, and as the sponge becomes full of blacking, it gives it out to the brushes through the perforations 5 amongst the hair tufts, by which it is readily communicated to the boots as they pass under and between the brushes. Instead of the small tubing in the joints, as shewn in the other brushes, the pressure and elasticity are maintained by two india-rubber tubes of unequal diameter running the whole length of the brushes. The upper tube  $m, m$ , is fixed at about  $2\frac{1}{2}$  inches high to the 10 side of the upright plate which separates each pair of brushes, its diameter is about 2 inches; it exerts an excellent pressure upon the brushes in every position. Under this is another tube  $m^1, m^1$ , about  $\frac{3}{8}$  of an inch in diameter, fixed in the same way at about an inch from the base of the brush. This small tube acts upon the upper part of the base brush. Should any additional 15 pressure be desired it can be easily secured by fixing small metal springs either inside or outside of the brushes. The blacking brushes are fixed to the inner side of the periphery of the drum like the other brushes; but a channel of perforated metal is made in the periphery immediately over the long bedding of sponge, and communicating therewith, so that the blacking as it 20 flows down these channels from the reservoir is at once absorbed by the sponge in contact therewith, and is immediately communicated through the perforations to all parts of the brushes.

Fig. 13 shows the arrangement of the blacking brushes in reference to the position of the reservoir and channels.  $N, N$ , is a moveable portion of the 25 periphery of the drum of the machine, and forms the base of the blacking brushes, as other portions of the periphery do of the other brushes. The 4 spaces  $n, n$ , represent the parts occupied by each pair of brushes. The frame  $n^1, n^1$ , represents the position of the blacking reservoir across the middle of the brushes from side to side of the machine, and at right angles to the 30 line of motion. The 5 orifices  $n^2, n^2$ , are the metal pipes, into which fit corresponding tubes at the bottom of the reservoir, and communicate with the channels  $n^3, n^3$ , running each side of the reservoir, the bottoms of which are perforated for conveying the blacking to the brushes.

Fig. 14 represents the blacking reservoir.  $O, O$ , is the body of the 35 reservoir, made of tin or other metal. The upper part is circular, with a flat bottom, to fix steadily on the frame  $n^1, n^1$ . It is about 2 or 3 inches wide, and the length is equal to the width of the machine;  $o$  is the lid;  $o^1, o^1$ , point out the position of the supply pipes at the bottom of the reservoir,



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and which fit into the tubes or orifices  $n^2$ ,  $n^2$ ; and  $o^2$  is the key which communicates with the taps in the supply pipes  $o^1$ ,  $o^1$ , and by which the supply of blacking to all the channels is regulated. The position of the blacking brushes being at the top of the machine, the reservoir will be situated exactly  
5 at the top of the curve, consequently the blacking will have a gradual descent down the channels on each side. This frame, containing the set of blacking brushes, is made to fasten into the machine, so as to be easily removed and refixed at pleasure; this is also the case with all the brushes, whether for boots or knives; by this means they can be readily examined, cleaned, and  
10 repaired without difficulty.

Fig. 15 gives a transverse sectional view of the internal part of the machine, showing the axis A and one of the bosses B, with a spring holder C for boots fitted into its place, the tenons  $b$ ,  $b$ , being slipped into and fastened in their mortices  $b$ ,  $b$ . An end view of the brushes is seen at K, K, with the  
15 legs between them, without the foot pieces and boots. J, J, is the periphery of the drum.

In Fig. 16 we have a sectional elevation of a part of the machine parallel to the line of motion, and showing the position of the boot-cleaning apparatus. J, J, is the periphery of the machine; A, the axis; B, B, an edge view of the  
20 bosses, with their line of motion; C, C, radiating spring holders, on one of which is seen a boot ready to be carried through the various brushes for cleaning; K shows the position of the dirt or cleaning brushes, they occupy about  $60^\circ$  of the circle. L marks the position of the blacking brushes, being situated at the top of the machine, they occupy about  $30^\circ$  or  $40^\circ$ ; while M  
25 shows the position of the polishing brushes, occupying about  $60^\circ$  of the periphery. The three sets of brushes should be placed in the machine as they are required. Let the set K for cleaning be placed in first, and when the machine has had a few turns both forward and backward with the boots on the spring holders, they will be cleaned from their dirt and ready for blacking.  
30 This set should then be removed, and the other two sets L and M should then be fastened into their proper places, with sufficient blacking in the reservoir, the taps opened, and after a few turns of the machine lift out the blacking brushes and finish off the boots with a few more revolutions, and they will be sufficiently polished for removal. In cleaning boots the machine should be  
35 turned several times in alternate directions, which will greatly add to the cleaning and polishing effects. This sized machine taking 4 boots on each spring holder, and with 16 radial bosses, would clean 64 boots at one operation.

For knives the improved cleaning apparatus consists of any required



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number of pairs of long spring brushes, and other suitable substances and surfaces adapted for cleaning, sharpening, and polishing knives and forks, which extend from the periphery of the drum about 8 inches or more towards the common axis, but at right angles thereto, and parallel to the plane of motion. These brushes and other surfaces (to all of which for the sake of 5 simplicity I give the general term brushes, whether they be composed wholly or partially of hair, bristles, leather, felt, cloth, india-rubber, or other suitable material for cleaning, sharpening, and polishing knives and such like articles) are placed with their faces in contact with each other, and may extend to any convenient distance round the periphery or circle of motion, so that as the 10 radiating spring holders rotate upon the axis they press the knives and forks between the several sets of cleaning, sharpening, and polishing brushes, which through their elastic pressure upon the articles secure the desired effects.

Fig. 17 shows a portion of the face of one of the cleaning brushes for knives and forks. The hair or other suitable material used is placed in 15 diagonal lines and parallel to those on the opposite brushes, so that the knives in passing between these surfaces and those on the face of the corresponding brush receive a perfect and even pressure throughout. The cleaning powder is supplied through perforated channels in the base. Additional elastic strength may be given to the brushes by fixing a small vulcanized india- 20 rubber tube behind them, as at E, E. The hair or other material used is inserted into the back of the brush e, e, which I prefer to be made of copper.

Fig. 18 is an end view of a portion of a set of these brushes showing how their surfaces meet, and between which the knives are carried with their backs forward in the line F, f, which prevents any injury to their edges, as 25 well as assists to sharpen them. In the space between the backs of each pair of brushes, as at f<sup>1</sup>, f<sup>1</sup>, I fill in a stuffing of india-rubber or other elastic material. These brushes are adapted for cleaning forks by giving a little more space between the surfaces, and fixing long bristles or hair at the base of the brushes, so as to act between the prongs. 30

Fig. 19 is an enlarged portion of the face of one of the sharpening brushes, which is composed of a series of long strips of leather, felt, india-rubber, gutta percha, or other elastic substance G, G, coated with cloth or other suitable material if necessary, and inserted into the back of the brush H, H, and running in a diagonal direction. Under these are fixed to the same founda- 35 tion india-rubber or gutta percha tubes I, I, which act in the twofold service of elastic pressure and support. The face of the opposite brush having also similar strips and tubes running parallel therewith, their surfaces not only meet, but by reciprocal pressure form a mutual curve, as seen in Fig. 20,



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which is an end view of 4 pairs of these brushes. G, G, are the elastic strips meeting together and forming an excellent double curve, through which the knives pass in the line G, g, the elasticity being strengthened by the tubes I, I. Upon these surfaces emery powder or other sharpening  
5 ingredient is well embedded, so that as the knives are pressed between these surfaces they become sharpened, and having a uniform action and pressure exerted upon them throughout, they are not subject to those inequalities of pressure arising from alternate surfaces in opposite positions, which are calculated to bend the knives and blunt the edges.

- 10 Instead of the strips and tubes as herein shown, they may be entirely dispensed with, and the same effect produced by employing a larger tube with a small one drawn in it, or stuffed with similar material, and coated and prepared in a similar way, and which by being fastened to the back by a strong metal band or wire passing through the bore would give the advantage of  
15 frequently changing the position of the sharpening surfaces as presented to the knives by only a slight revolution of the tube. A slip of thin sheet metal may be fixed along the fronts of the strips or tubes about  $\frac{3}{4}$  of an inch high, and terminating in a thin edge. This will protect the apparatus from being injured by bent and crooked knives, and also prove an excellent guide, as at  
20 J, J, J. This arrangement is also adapted for the polishing brushes, with a slight modification as to a softer coating material and finer ingredients for polishing.

In Fig. 21, K, K, is the frame or base of a set of cleaning brushes, suited for 12 knives abreast at a time, being the number each spring holder carries  
25 through the brushes at one time. It forms a chamber to hold the cleaning or other powder, about 1 or 2 inches deep, and of the dimensions of the frame, with a suitable lid; k, k, are openings into the faces of the brushes where there surfaces meet, and between which the knives are carried. These openings are angular at the bottom next the brushes and open directly into the brushes, so  
30 that these being kept full of the required powder, give it out to the brushes, which draw it in by their mutual action each time the knives pass through them. They could also be supplied with the powder in a similar way to that of the blacking brushes, by a reservoir communicating by pipes to the channels; but the former way is the more simple.

- 35 Fig. 22 shows a front elevation of one of the radii of the machine, illustrating the application of the radial bosses and spring holders to the purpose of cleaning knives and forks.

A, A, is the axis; B, B, one of the radial bosses; D, D, one of the spring holders adapted for knives and forks, and fitted by its tenons b, b, into the



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mortices *b, b*, of the boss. *K, K*, a set of cleaning brushes, in which some knives are seen in their places and passing through the brushes between their surfaces. *J, J*, is the periphery of the drum and to which the brushes are attached. The knives are placed in the spring holder by their handles edge-ways *d, d*, and the forks with their handles flatways. The handles being 5 entirely within the spring they are protected and secured by the lid *d<sup>1</sup>, d<sup>1</sup>*, and the hilt or shoulder of the knife being outside with the blade among the brushes. The edge of the knife must always be placed downwards, as the line of motion is from back to edge; this prevents the edges being blunted and bent, while it has also a sharpening effect upon the edges. The backward motion 10 is prevented by the spring stops *d<sup>2</sup>, d<sup>2</sup>*; but for forks the motion is both forward and backward alternately, that is, several times each way.

Fig. 23, a sectional elevation of a part of the machine at right angles to the axis, and parallel to the line of motion, similar to Fig. 16. This shows edge-ways the radial bosses with their line of motion *B, B*, the radiating spring 15 holders *D, D*, with knives in their revolutions amongst the faces of the brushes. The knife-cleaning apparatus in this occupies similar and corresponding positions to the boot-cleaning apparatus in Fig 16. *K, K*, show the position of the cleaning brushes occupying about 60° of the circle or periphery; *L, L*, represent the sharpening brushes which occupy about 30° or 40°; and *M, M*, 20 mark the position of the polishing brushes, with the manner of the knives passing over their faces. This sized machine will allow for 16 radial bosses to be fixed upon the axis, and each boss carries a spring holder with at least a dozen knives in it; 16 dozen knives can therefore be cleaned, sharpened, and polished at one operation by this machine. 25

Fig. 24 is an end view of the machine, mounted on a plain stand and turned by handle. *J, J*, is the fixed drum of the machine; *K* is an arc of the periphery which forms the frame and base of the sets of cleaning brushes, whether for boots or knives, and is made to fasten into the drum and to lift out at pleasure. *L* is also a moveable part of the arc which forms the frame 30 and base of the set of blacking brushes and also the set of sharpening brushes. The polishing brushes both for boots and knives, represented by the dotted *M*, occupy an opposite arc to *K*, and of the same size. *N* is one of the doors into the drum.

Fig. 25 is a front elevation of the machine; *N, N*, are two doors by which 35 the spring holders can be fixed into the bosses, boots and knives placed on and removed from the spring holders, and all articles under the cleaning process may be brought to these doors for examination by a slight turn of the handle, without the inconvenience of taking them out of the machine for



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inspection. The drum of the machine being fixed to the standards of the supporting frame, allows every part of its internal machinery and apparatus to undergo a frequent and easy examination. When the articles are placed successively in the spring holders at either door, a turn of the handle carries  
5 them through the cleaning brushes at K, and then through the blacking or sharpening brushes at L, and thence through the polishing brushes at M, by leaving the space in the lower part of the drum free from brushes, it not only gives the convenience of room, but allows the articles to partially dry and cool before re-entering the brushes, which is of great advantage. The machine may  
10 be mounted on any convenient stand, and a rotary motion given to the axis either by handle, with or without a fly wheel, or treadle and crank, or other approved mode or power.

Having thus fully described and shown the nature and object of my Invention, and the manner in which the same is to be performed, I wish it to be  
15 distinctly understood that I do not confine myself to the precise details herein given and set forth, so long as the peculiar character of my Invention be retained; and that what I claim as my Invention, to be secured by the herein-before in part recited Royal Letters Patent, is, the making of "Improved Boot and Knife Cleaning Machines" with radial bosses and spring  
20 holders, by the revolutions of which the articles to be cleaned are carried through sets of improved cleaning apparatus attached wholly or partially to the periphery of the machine, upon the principles and in the manner described and exhibited in the foregoing Specification and Drawings.

In witness whereof, I, the said Tobiah Pepper, have hereunto set my  
25 hand and seal, this Twenty-second day of October, in the year of our Lord One thousand eight hundred and sixty-four.

TOBIAH PEPPER. (L.S.)

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